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CHARLES H. WILLIAMS (1850–1918)

Fellow in Class I, Section 2, 1914

Charles Herbert Williams was born in Boston April 29, 1850. He was the eldest son of Dr. H. W. Williams, Professor of Ophthalmology in the Harvard Medical School, and for many years one of the most distinguished specialists in ocular diseases. The son was graduated from Harvard College in the Class of 1871, and then entered the Harvard Medical School from which he was graduated three years later. With unusual aptitude and inclination toward his father's specialty, he then went abroad and spent the most of the next two years in studying ophthalmology in Zurich, Vienna, and then at Utrecht under Professor Donders, the great pioneer in the investigation and treatment of astigmatism. On returning in 1876 he entered practice with his father at the old home, 15 Arlington St. and spent the next decade in active work at his chosen profession.

In 1886 he turned his face westward and assumed an administrative position with the C. B. & Q. Railway, an association which eventually turned his talents into the path along which he was to march far. Presently he became head of the medical and health insurance interests of the great railway system with which he was associated, and his attention was drawn sharply to the grave question of defective vision and especially defective color sense among railway employees. At about that time color blindness as a serious danger was just coming to be fully recognized, and it was to the study of this that Dr. Williams devoted his special attention. About half of the employees of an ordinary railway system have occasion in one way or another to use signals, and since mankind shows three to four per cent of serious cases of color blindness the number of railway employees thus dangerously defective might run to many thousands. With this condition complicated by vision otherwise defective the importance of the field of research undertaken by Dr. Williams is vital.

Up to that time the ordinary means of testing color vision was by the Holmgren worsteds, a scheme most ingeniously devised and in careful hands very effective for diagnosis. Dr. Williams was among the first to recognize the fact that while these worsteds told a truthful story of failing color vision they did not tell the whole of it, since there are many cases of defective central vision due to tobacco or alcoholism which do not show with the Holmgren skeins by reason of these being sufficiently large considerably to overlap the affected area. Further, the psychological effect of testing a man's fitness for employment by setting him at sorting colored wools is bad, for he may not unnaturally think that colored lights would be quite a different matter. Color discs had of course been used in testing but Dr. Williams studied the subject deeply and in 1891 introduced into the C. B. & Q. system a complete scheme for testing the vision of railway men; a set of carefully prepared cards on Snellen's system with special precautions against the possibilities of memorizing, the Holmgren worsteds with the addition of a scheme of numbering to facilitate the complete record of each case, colored signal flags, and finally a lantern showing colored lights, which he afterwards greatly improved.

This was at first used only in dubious cases, but more and more reliance became gradually to be placed on it until in its later form it was accepted as the standard test on many important railway systems. The improvement in Dr. Williams' lantern over the colored glass test introduced by his old instructor Professor Donders, and improved by others, lay in the completeness of its correspondence to the working condition of observing railway signals. It includes use of colored spots of varying size and intensity, of those involving contrast of normal and signal lights, the introduction of confusion colors and such as might come from the modifying influence of atmosphere, and the presentation of combinations so diverse as to give absolutely no chance of passing the test by memorizing, or by the judgments of intensities on which the color blind often consciously or unconsciously depend. It has been found in practice that this lantern can detect many cases that escape examination by the worsteds, and therefore much more effectively eliminate a class of employees which is doubly dangerous from its unconsciousness of its own visual failings.

Dr. Williams also did much to improve the general testing of vision by the design of accurate and uniform test cards and the study of their proper illumination for testing purposes. He also introduced a very ingenious modification of the Snellen types for railway work consisting of characters simulating the various semaphore positions which the railway man has to note.

In 1895 he returned to Boston and began again the regular practice of his profession, not, however, leaving but rather further cultivating the special field of his endeavors. The impression that his work up to this time had made on his colleagues is well noted in a letter received by him from Snellen, in which that great ophthalmologist, recalling pleasant days which he had spent with Dr. Williams abroad, said of his return to general practice, "I am glad that you have come back to the old flag."

While industriously following the daily routine of his profession Dr. Williams kept on with his study of vision and of signalling, and devoted no little time to the improvement and testing of railway signal lights, in which he was most expert and resourceful. He served on many committees of the American Ophthalmological Society and had a large share in the preparation of their test cards and recommendations for improved methods, and wrote many papers before professional societies dealing with the general problem of the critical diagnosis of imperfect vision.

As an incident to his work upon signal lights he devised an extremely simple and useful modification of the photographic wedge photometer, a pocket instrument working on the extinction principle and capable in careful hands of remarkably useful work. This instrument came into considerable use among railway signal experts as well as among those interested in scientific photometry, to whom it has great use as an auxiliary for the quick investigation of photometric conditions. A little later he devised still another photometer of the equality-of-brightness type, employing as before the photographic wedge, which proved particularly useful in comparing the brightness of surfaces and estimating the density of smoke and cloud. He became an early member of the Illuminating Engineering Society and frequently took useful part in its discussions, and was beside a member of many societies and clubs. He was elected to our Academy January 14, 1914, and until very recent years was a frequent attendant at its meetings. The study of color vision he kept up, as far as strength permitted, almost to the end and was for a score of years a frequent lecturer on the problems connected with color blindness at the Harvard Medical School and elsewhere in professional gatherings. In a practical way no American ophthalmologist has done more toward the investigation of this curious and mysterious condition.

In later years a malady of the heart gave his friends much anxiety, and to it, after a gallant struggle, he succumbed on June 9th, 1918. Professionally eminent, he was above all things a charming and courteous gentleman, beloved of his many friends, always ready and eager to lend a helping hand in the advancement of science, and his loss came with a sense of real grief to his colleagues in this Academy.

Louis Bell.